

**MELANORHOPALA FROESCHNERI (HETEROPTERA: TINGIDAE):  
A NEW LACE BUG FROM EASTERN UNITED STATES,  
WITH NOTES ON HOST PLANT AND HABITS,  
DESCRIPTION OF FIFTH INSTAR, AND  
KEY TO SPECIES OF THE GENUS**

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*Abstract.*—The new species *Melanorhopala froeschneri* (Heteroptera: Tingidae) is described from Delaware, Kentucky, Maryland, North Carolina, and Tennessee, and compared with the three previously described species of the genus. The fifth instar is described and illustrated; notes are given on the bug's host plant, *Campsis radicans* (L.) Seem. (Bignoniaceae), and on its habits; and a key is provided to separate the known species of *Melanorhopala*.

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While collecting in Delaware in 1982, we discovered three specimens of a lace bug tentatively identified as *Melanorhopala infuscata* Parshley. Later collecting of numerous adults and nymphs and the discovery of the host of this interesting bug revealed that we had an undescribed species. Prior to this study, only three species of *Melanorhopala* Stål were recognized: *M. balli* Drake, known from the holotype taken in Colorado; *M. infuscata* from the District of Columbia, Maryland, North Carolina, and Virginia; and *M. clavata* (Stål) widely distributed from New England west to Wyoming and Colorado, and south to Florida (Drake and Ruhoff, 1965; Horn et al., 1979).

Herein, we describe the new species *Melanorhopala froeschneri*, provide electron micrographs of the adult and an illustration and description of the fifth instar, give notes on the host plant and habits, and provide a key to separate the four known species of the genus.

We are honored to dedicate the name of this cryptic new tingid to our friend and colleague Richard C. Froeschner. We also gratefully acknowledge the help and advice he has given freely over the years. Although always busy with his research, curating of the National Hemiptera Collection, building literature files, and helping others with their sometimes almost overwhelming requests, Dick has always stopped his own pursuits to cheerfully help us with our inquiries and problems or to offer welcomed philosophical thought that only he can generate.

Genus *Melanorhopala* Stål

*Tingis* (*Melanorhopala*) Stål, 1873:130.

*Melanorhopala*: Horvath, 1908:564.

*Diagnosis.* Generally elongate, hemelytra subparallel in macropterous males, elongate oval in females and brachypterous specimens; head quadrate, armed with five elongate, decurved spines (Figs. 3, 4), bucculae greatly expanded, rectangular in lateral view, contiguous anteriorly but not fused, extending length of head to near front of acetabula just under anterior margin of pronotum (Fig. 4); antennae cylindrical, slightly thickened, segment III longest, often clavate apically, segments I and II short, barrel-shaped, segment IV fusiform; pronotum tricarinate, lacking a raised hood, paranota narrow, reflexed, and flattened against pronotum; hemelytra uniformly areolate, apices quadrate and slightly rounded in macropterous forms, apically acuminate and diverging in brachypterous specimens, costal area with one or two rows of areoles.

*Type species.* *Tingis clavata* Stål, 1873; fixed by Van Duzee, 1916: 26.

*Remarks.* *Melanorhopala* is most closely related to the genera *Alveotisingis* Osborn and Drake and *Hesperotisingis* Parshley. It can be distinguished as follows: *Alveotisingis* with antennal segment III uniformly thickened, hemelytra broadly rounded apically and laterally, discoidal area not bordered by a carina (or thickened veins); *Hesperotisingis* with antennal segment III thickened on apical half, hemelytra broadly oval, rounded apically, discoidal area bordered by a carina; *Melanorhopala* with antennal segment III uniformly slender to slightly swollen on apical half, sometimes apically clavate, hemelytra subparallel to elongate oval, apically quadrate and slightly rounded in macropterous specimens, apically acuminate and diverging in brachypterous ones; discoidal area bordered by carina. Hurd (1946) provided a good diagnosis and key to these genera.

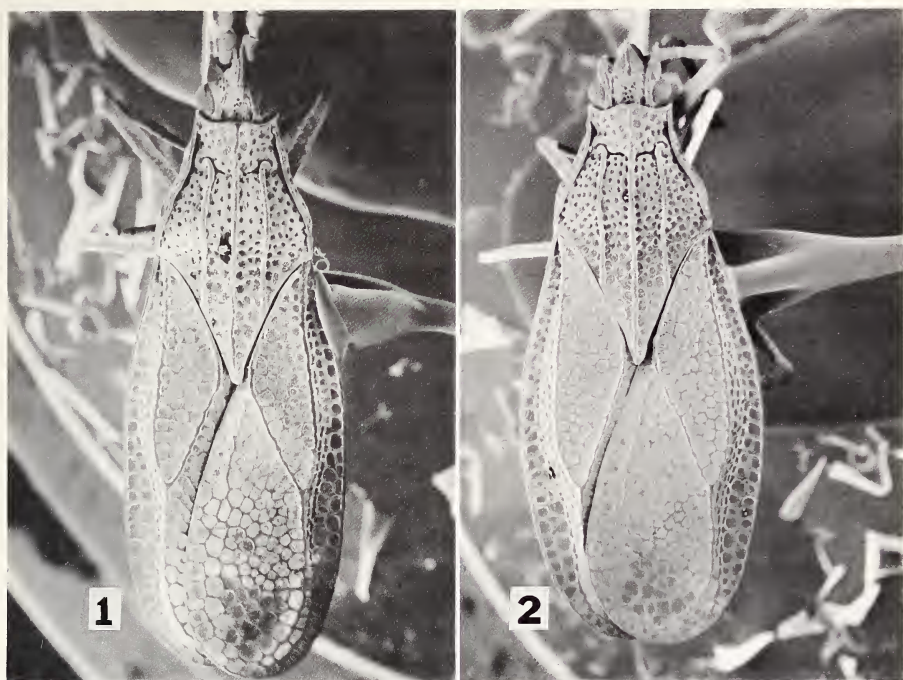
#### KEY TO SPECIES OF *Melanorhopala*

1. Rostrum extending to or beyond hind coxae ..... 2
- Rostrum not extending beyond middle coxae ..... 3
2. Antennal segment II distinctly shorter and more slender than segment I; antennal segment III uniformly slender (Figs. 8, 9); lateral height of eye distinctly less than distance from lower margin of eye to lower margin of buccula ..... *infuscata* Parshley
- Antennal segment II subequal to length and thickness of segment I (Fig. 3); antennal segment III distinctly thicker on basal half (Figs. 6, 7); lateral height of eye distinctly greater than distance from lower margin of eye to lower margin of buccula (Fig. 4) ..... *froeschneri*, new species
3. Antennal segment I nearly  $2\times$  length of segment II (Figs. 10, 11); segment III distinctly clavate apically in females (Fig. 11); length of segment III at least  $4\times$  combined length of segments I and II; length 5.00 mm or more ..... *clavata* (Stål)
- Antennal segment I only slightly longer than segment II (Fig. 5); antennal segment III not clavate apically (Fig. 5); length of segment III less than  $3\times$  combined length of segments I and II; length 3.25 mm or less ..... *balli* Drake

#### *Melanorhopala froeschneri*, new species

Figs. 1–4, 6, 7

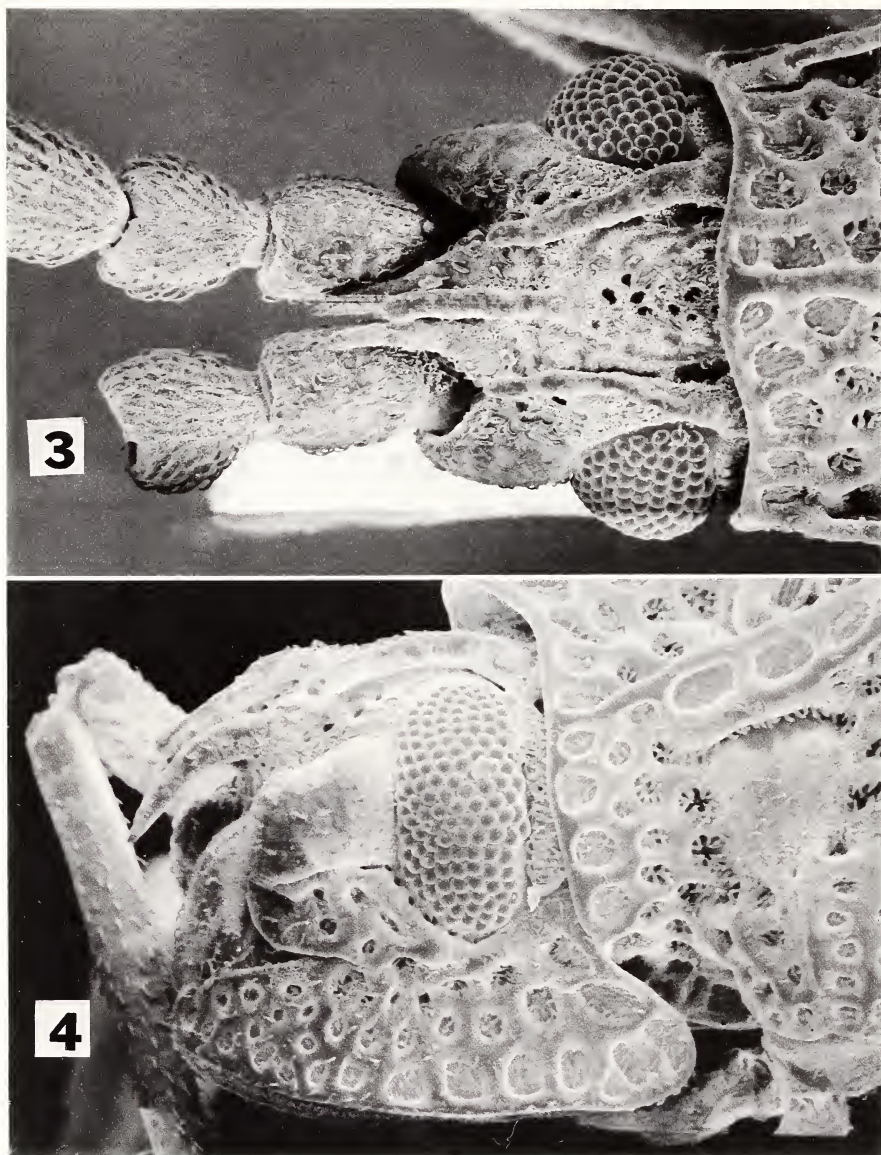
*Description.* General coloration yellowish brown, with a few fuscous markings on hemelytra and sparsely set with short, appressed, thickened setae. Head quadrate, antennae set in front of eyes, antenniferous tubercle surrounding base of segment I, eyes red, proportionately large (compared to *infuscata*), crescent-shaped around side



Figs. 1, 2. Dorsal views of *Melanorhopala froeschneri*. 1. paratype male. 2. paratype female.

of head, higher than long, height from lateral aspect greater than distance from lower margin of eye to lower margin of buccula (Fig. 4); dorsum with 5 reclining spines (Fig. 3), 2 laterally, arising from posterior lobe, extending to bases of anterior spines, bases just covered by anterior margin of pronotum, mesal spine arising at level even with anterior margin of eyes, 2 forward spines arising at level with antennal bases, apices curving inward and around apex of mesal spine, forming a loose but rather thick-pointed process; vertex between lateral spines and posterior to mesal spine deeply punctate, with a few sericeous setae; buccula large, rectangular in lateral aspect, ventrally forming an elongate U-shaped margin around first rostral segment. Rostrum extending beyond metacoxae to posterior margin of 2nd abdominal segment. Antennae moderately thickened (Figs. 6, 7), closely set with appressed thickened setae, segments I and II barrel-shaped, subequal in length, segment III longest, distinctly thickened on basal half, tapering to apex, uniformly yellowish brown, becoming infuscated on some specimens (at least dead ones), segment IV fusiform, 2 or more times the length of I and II combined. Pronotum tricarinate (Figs. 1, 2), much longer than wide, widest at humeral angles, anterior lobe narrowest, width about equal to width of head across eyes, gradually widening to humeral angles of posterior lobe, basal process triangular, covering scutellar area. Hemelytra yellowish brown, areoles fuscous along inner margin of corium and middle of basal half and on either side of sutural or "membranal" area, subparallel in males (Fig. 1), slightly widened across middle, elongate oval in females (Fig. 2), apex subtruncate, broadly rounded, bra-

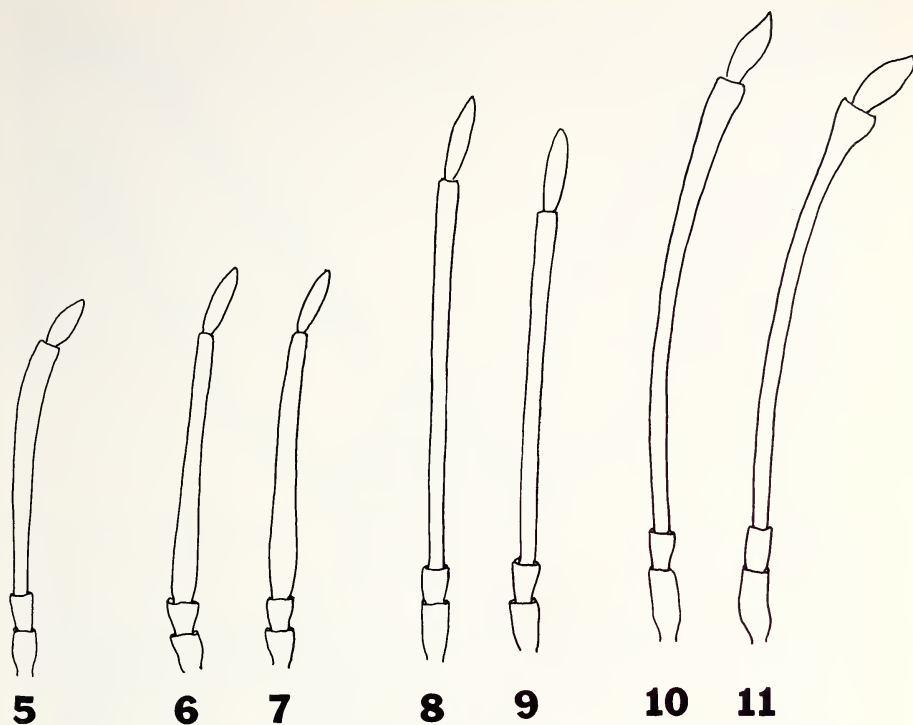




Figs. 3–4. *Melanorhopala froeschneri*. 3. Dorsal view of head (paratype male). 4. Lateral view of head with antennae removed (paratype female).

chypterous forms unknown, costal area with a single row of areoles on basal half. Ventral surface and legs yellowish brown, tarsi and claws fuscous.

*Measurements* (female in parentheses; all measurements in millimeters). Male length [head to apex of hemelytra] 4.24–4.60 (4.48–5.08), width across widest point



Figs. 5–11. Antennae of *Melanorhopala* spp. 5. *balli*, male. 6. *froeschneri*, male. 7. *froeschneri*, female. 8. *infuscata*, male. 9. *infuscata*, female. 10. *clavata*, male. 11. *clavata*, female.

of hemelytra 1.44–1.66 (1.80–1.88). Head width 0.60 [all specimens measured] (0.56–0.64). Antennae: Length of segment I 0.20–0.24 (0.22–0.24), width 0.16–0.18 (0.14–0.16); II 0.16–0.20 (0.16), width 0.16–0.18 (0.14–0.16); III 1.60–1.68 (1.46–1.60); basal width 0.16–0.18 (0.12–0.16), apical width 0.14 (0.12–0.16); IV 0.46–0.48 (0.42–0.48). Pronotal length 1.80–1.96 (1.92–2.04), humeral width 1.06–1.16 (1.12–1.16).

*Holotype*. ♂ USA. *Tennessee*: *Tipton Co.*, Covington, Rt 51, June 2, 1985, T. J. Henry (TJH) and A. G. Wheeler, Jr. (AGW) colls., taken on vines of trumpet creeper, *Campsis radicans* (L.) Seem.; deposited in the National Museum of Natural History, Washington, D.C. [USNM].

*Paratypes*. DELAWARE: 2♂♂, ♀, *Sussex Co.*, Trussum Pond, Jul. 10, 1982, on bark of *Taxodium distichum* (L.) L. C. Rich. [*C. radicans* vines present], AGW (Bureau of Plant Industry, Pennsylvania Department of Agriculture, Harrisburg [BPI]). KENTUCKY: 7 ♂♂, 2 ♀♀, *Warren Co.*, Bowling Green, June 5, 1985; TJH and AGW, on *C. radicans* (BPI, USNM). MARYLAND: ♂, ♀, *Calvert Co.*, Rt. 4, Lusby, 20 Jul. 1985, TJH and AGW, on *C. radicans* (BPI, USNM); 2♂♂, 2 ♀♀, *Caroline Co.*, 4 Jul. 1985, TJH and K. Henderson-Henry, on *C. radicans* (USNM); 2 ♀♀, *St. Mary's Co.*, Rt 4, Town Point, Jul. 20, 1985, TJH and AGW, on *C. radicans* (BPI, USNM); ♀, *St. Mary's Co.*, Point Lookout, Jul. 20, 1985, TJH and AGW on *C. radicans* (BPI, USNM); ♀, *Queen Annes Co.*, Church Hill, Jul. 27, 1985, on *C. radicans*, AGW (BPI).

NORTH CAROLINA: 6♂♂, 7 ♀♀, *Craven Co.*, New Bern, June 15, 1985, on *C. radicans* AGW (BPI); ♂, ♀, *Martin Co.*, Williamston, June 15, 1985, on *C. radicans*, AGW (BPI). TENNESSEE: 9♂♂, 7 ♀♀, same data as for holotype (BPI, USNM); 11♂♂, ♀, *Tipton Co.*, Rt 51, 3 mi N of Covington, June 2, 1985, TJH and AGW, on *C. radicans* (BPI, USNM).

*Remarks.* As shown in the key, *froeschneri* is most closely related to *infusca* in the generally subparallel, macropterous (brachypterous forms are unknown) hemelytra that are subtruncate apically (Figs. 1, 2), the apically slender antennal segment III (Figs. 6–9), and the long rostrum. The unique male holotype of *balli* (indicated as a female in the original description) and most specimens of *clavata* are brachypterous, having the hemelytra acuminate and diverging apically. Macropterous individuals of the latter apparently are rare as only 3 or 4 fully winged specimens (out of more than 100) are in the USNM collection.

## DESCRIPTION OF FIFTH INSTAR

Fig. 12

*Description* (in alcohol, N = 5). Pale yellowish brown, elongate oval, length 3.33–3.50. Head quadrate, antenniferous tubercles distinct, somewhat acute on outer ½ in dorsal aspect; armed with 5 erect spines, each spine set with tiny, setigerous tubercles, 2 basal spines longest, set on vertex at inner posterior margin of each eye, mesal spine at middle of frons, sometimes apically bifid, 2 anterior spines at base of tylus between antenniferous tubercles; Y-shaped epicranial suture distinct, pale. Rostrum length 1.75–1.76, extending to base of second abdominal segment, segment one set in gular groove, laterally margined by bucculae. Antennae: Segment I length 0.14–0.16, barrel-shaped; II 0.10–0.12, barrel-shaped; III 1.20–1.24, cylindrical, thickened on basal ½, tapering apically, some specimens infuscated on apical ½; IV 0.42–0.46, fusiform, fuscous. Pronotum trapeziform, concave, posterior margin broadly tapered to a distinct point, meson with a pale, narrow carina, area around calli transversely depressed, lateral margins with 2 erect spines, the posterior spine longest; wing pads elongate, broadly rounded and infuscated apically, lateral margin of each with 2 erect spines. Abdomen broadly rounded, concave with central ⅓ raised and rounded dorsally, raised area with 5 erect spines, 1 at middle of segment II and a pair on segments V and VI; laterally set with an erect spine at posterior angle of each segment, genital segment with 2 spines directed posteriorly. Venter uniformly pale yellowish brown, meson of abdomen with distinct keel; legs pale yellowish brown, unarmed, set with extremely fine, short setae.

## NOTES ON HABITAT AND HOST

We have found *M. froeschneri* only on trumpet creeper, a deciduous, woody vine characterized by large, short-stalked, trumpet-shaped flowers and clinging, aerial rootlets. This bignoniaceous plant, native from New Jersey to Ohio, Florida, and Texas and hardy as far north as Massachusetts, is common in moist woods, on fence-rows, and along roadsides. Used for covering tree stumps, masonry walls, and rock outcrops, *Campsis radicans* often escapes from cultivation and in the southern states may be a weed in cropland (Gleason, 1963; Everett, 1981).



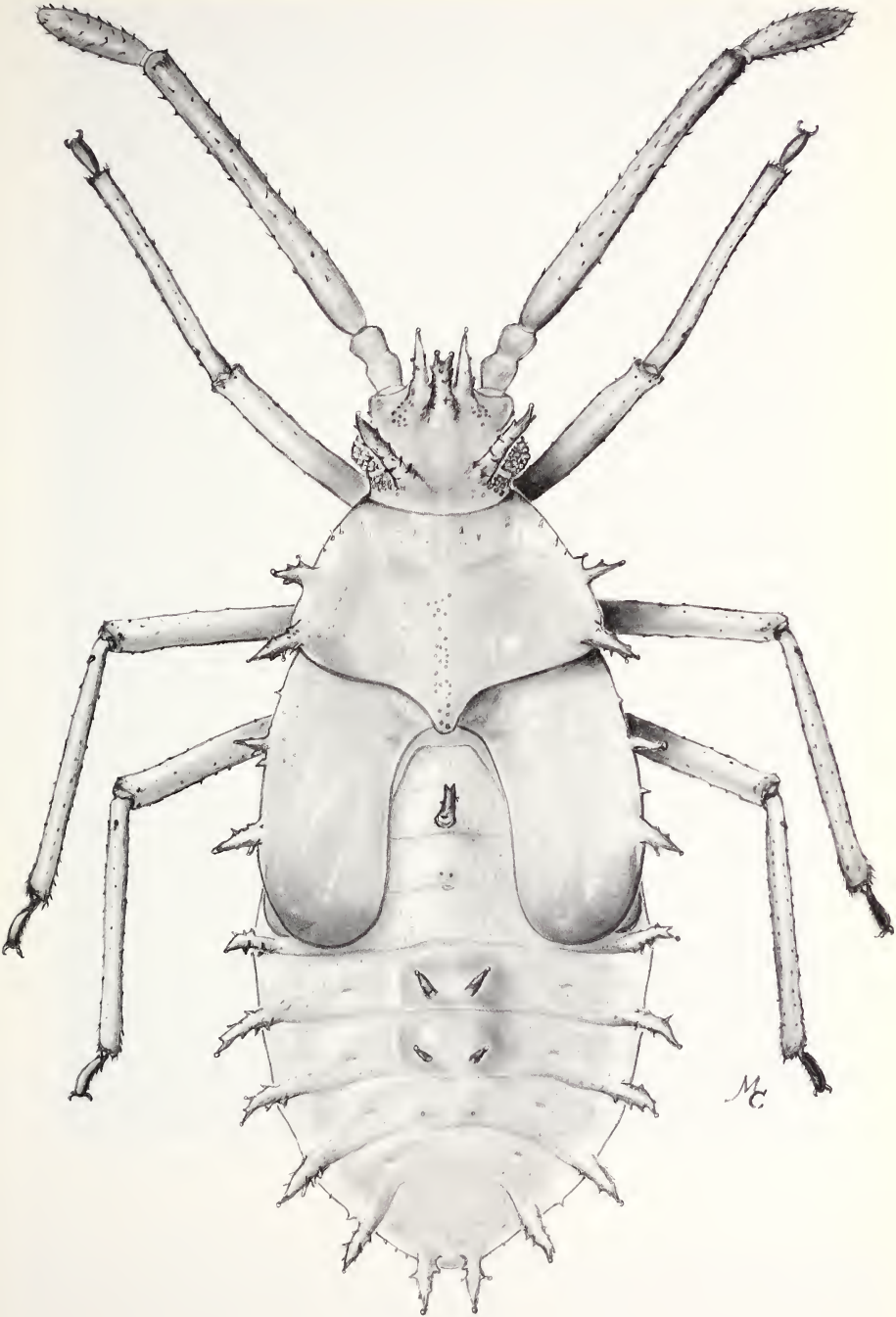


Fig. 12. Dorsal view of fifth-instar nymph.



Fig. 13. Typical habitat of *M. froeschneri*, showing trumpet creeper on tree trunk.

*Melanorhopala froeschneri* was collected on *C. radicans* growing mainly in shaded situations along hedge rows and woodland borders. Nymphs and adults were beaten from trumpet creeper attached to various deciduous trees and to conifers such as bald cypress and pine. We also detected populations by pulling vines away from tree



trunks (Fig. 13) and observing the bugs crawling on trumpet creeper stems or scurrying for cover in bark crevices. They were associated with and appeared to feed only on the thicker, green stems (the latter also observed in rearing dishes) rather than on young stems or older, brown stems. Only in one locality did we find bugs on sprawling vines not attached to a tree. In this case, the unusually large size of the population on adjacent vines attached to a tree trunk appeared to account for this exception.

Colonization of *C. radicans* by *M. froeschneri* probably depends not on the "host" tree but on growth stage of the vine (populations were not observed on young vines) and on suitable conditions of humidity and other microenvironmental factors provided by the vines and "host" tree. On one occasion we observed black excrement on a trumpet creeper leaflet but, unlike most tingids, *M. froeschneri* does not colonize and feed on (at least to any extent) the abaxial surface of host foliage. Our collection of mainly late instars and teneral adults in Kentucky and Tennessee in early June, adults and only an occasional late instar in North Carolina and Virginia in mid-June, and adults only in Delaware and Maryland during July suggests that this lace bug has a univoltine life cycle.

Even though *M. froeschneri* may be abundant on trumpet creeper (more than 50 or 100 individuals on a vine), the cryptic, stem-feeding habits of this lace bug nearly preclude its detection by usual collecting methods. In general, *Melanorhopala* spp. are poorly represented in collections, and the habits of these bugs are little known. In the Washington, D.C., area *M. infuscata* has been taken on bark and at sap of tulip tree, *Liriodendron tulipifera* L. (Parshley, 1917, 1920), and on flowers of New Jersey tea, *Ceanothus americanus* L. (McAtee, 1923). Parshley (1920) suggested that *M. infuscata* lives on the bark of tulip tree, where it perhaps subsists "on sap from the trunk rather than from the leaves." An alternative hypothesis is that this species develops on stems of some vining plant attached to *Liriodendron* and other trees. The possibility that certain *Melanorhopala* spp. feed on vines and that *M. clavata* is associated with stems of its apparent host, goldenrod (Bailey, 1951; Slater and Baranowski, 1978), deserves consideration.

#### ACKNOWLEDGMENTS

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